

**REMARKS**

Claims 1-20 are currently pending in the application. By this amendment, claims 1 and 2-5 are amended and claims 12-20 are added for the Examiner's consideration. The above added claims do not add new matter to the application and are fully supported by the specification. For example, support for the added claims is provided at Figures 1-4, and the description thereof. The newly added claims are directed to the elected embodiment, with at least claims 12 and 18 being generic claims. Reconsideration of the rejected claims in view of the above amendments and the following remarks is respectfully requested.

***Objection to Claims***

Claims 4 and 5 were objected to for informalities. Claims 4 and 5 have been amended to correct the informalities. (Claims 2 and 3 are amended to correct minor typographical and grammatical errors.) These claim amendments are not made for reasons of patentability and should not be considered narrowing amendments, affecting the scope thereof.

Applicants respectfully request that the rejection over claims 4 and 5 be withdrawn.

**35 U.S.C. §102 Rejections**

Claims 1, 4 and 9 were rejected under 35 U.S.C. §102(b) for being anticipated by U. S. Patent No. 5,947,233 to Kobayashi. Claims 1-10 were rejected under 35 U.S.C. §102(b) for being anticipated by JP 56-129624. These rejections are respectfully traversed.

The present invention is capable of preventing friction pads from falling off a caliper bracket during the assembly, e.g., attaching, of the friction pads to caliper support arms of the caliper bracket. The present invention is also able to return the friction pads to an original position away from the rotor, after a braking force has been stopped, and additionally effectively prevents play of ears of the pads to reduce brake noise and suppress juddering caused by wear of a disc rotor. This effectively prevents the generation of a friction pad striking sound due to play of the ears.

In embodiments, this is accomplished using pad retainers, which, in part, comprise pad springing-back portions. The pad retainers support the friction pads, in addition to urging the friction pads away from the rotor, upon release of the braking. In one embodiment, the invention comprises, in part,

... friction pads disposed on both sides of the disc rotor,  
the friction pads having ears projected from both side portions  
of a back plate thereof, and

pad retainers disposed on the pad guide grooves, the ears of the friction pads being movably supported by the pad guide grooves and between receiving portions of the pad retainers;

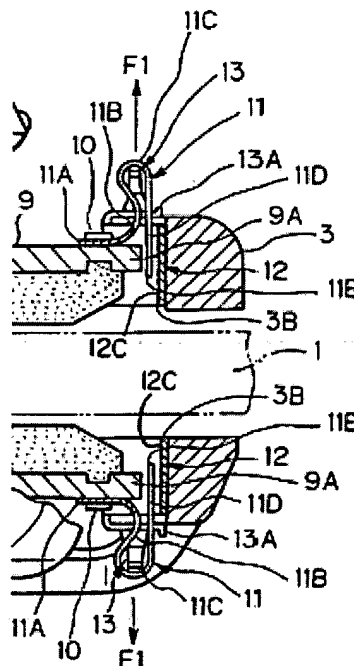
wherein pad retainers each has pad returning portions for urging the friction pads away from the disc rotor.

These features, however, are not shown or described in either Kobayashi or JP 56-129624. For example, in Kobayashi it is doubtful whether the return spring 13 can reliably urge the friction pad 8 in such a manner as recited in the present invention.

More specifically, a return spring 13 of Kobayashi urges the friction pad 8 away from the disc rotor 1 by grappling a bent portion 11C of a wear warning element 1 which is attached to the friction pad 8. Since the wear detecting portion 11E is a free end, and the wear warning element 11 does not have an urging force pushing the friction pad against the bracket. However, since the wear warning element has certain rigidity, it can be easily deformed. Thus the wear warning element is deformed when load is applied thereto. Accordingly, it is doubtful whether the return spring 13 can reliably urge the friction pad 8 in such a manner. To the contrary, according to the present invention, the pad returning portion 20b urges the friction pad 6 directly. More specifically, the pad returning portion 20b urges an ear of the friction pad 6. Accordingly, the pad returning portion 20b can urge the friction pad 6 away from the disc rotor.

In more detail, Kobayashi shows a disc brake which includes a disc or rotor 1 rotatable with a corresponding vehicle. The disc brake includes a carrier 2 located at the inboard side of the disc 1 and secured to a fixed part of the vehicle. The carrier 2 includes a pair of axially and outwardly extending arms 3, 3, a bridge portion 4, and a beam 5 extending between the distal ends of the arms 3, 3. Inboard and outboard friction pads 8, 8 are located at opposite sides of the rotor 1.

As shown in FIG. 3, reproduced partially below, backing plates 9, 9 are attached to the inboard side of the inboard friction pad 8 and the outboard side of the outboard friction pad 8, respectively. The backing plates 9, 9 have opposite lugs 9A, 9A which are engaged within the corresponding pad guides 3B, 3B of the arms 3, 3 through guide plates 12C, 12C of the pad springs 12, 12.



As thus seen above, the friction pads 8, 8 are slidably supported on the pad guides 3B, 3B through the lugs 9A, 9A. In contrast, in the presently claimed invention, the ears of the friction pads are movably supported by the pad guide grooves between receiving portions of the pad retainers.

In Kobayashi, each of the pad springs 12 generally includes a bridge portion 12A engaged with the inner surface of the arm 3, a pair of flat plates 12B, 12B, a pair of guide plates 12C, 12C bent radially outwardly from the flat plates 12B, 12B, engaged with the pad guides 3B, 3B of the arm 3, a pair of depending extension plates 12D, 12D, and a pair of pad rests 12E, 12E. The extension plates 12D have return springs 13, 13 which include abutment portions 13A, 13A extending outwardly from the extension plates 12D, wide bent portions 13B, 13B bent upwardly from the lower end of the abutment portions 13A, 13A, and elongated bias portions 13C, 13C extending upwardly from the upper end of the bent portions 13B, 13B. Projections 13D, 13D are resiliently in point contact with the inner surface of the bent portions 11C of the wear warning elements 11 so as to bias the wear warning elements in opposite directions as shown by the arrows F1 in FIG. 3 and thus, urge the friction pads 8, 8 in a direction away from the rotor 1. In contrast, the pad returning portions of the pad retainers urge the friction pads away from the disc rotor.

*JP 56-129624*

JP 56-129624 also does not show the features of the claimed invention and more specifically a receiving portion of the pad retainer so as to support the friction pad. In JP 56-129624, a spring element 25 is shown to include an arc section 27, in addition to two leg portions 26, 28. The leg portion 26 includes an outward extending extension, which is in conjunction with the arc section 27 is used as a clamp. However, JP 56-129624 does not receiving portions of the pad retainer so as to support the friction pad.

Despite the Examiner's argument to the contrary, Applicants also submit that JP 56-129624 does not show many of the features of the dependent claims. For example, JP 56-129624 does not show:

- (i) An elastic loop portion formed by a long and narrow piece outwardly extended away from the disc rotor in the disc axial direction and bent back to the disc rotor in the disc axial direction; and a pad springing-back portion formed by the long and narrow piece further extended toward the disc rotor and outwardly inclined in a disc radial direction (claim 2).
- (ii) The long and narrow piece of the elastic loop portion bent back so as to form a circular arc, and the long and narrow piece of the pad springing-back portion warped as a shape of a curvature (claim 3).

- (iii) A pad retainer including a receiving piece contacted with a disc radial direction inner side face and a long and narrow piece extended from the receiving piece away from the disc rotor (claim 5).
- (iv) A proximal portion of the long and narrow piece bent back toward the disc rotor in circular arc form to form an elastic loop portion (claim 5).
- (v) A tip portion of the long and narrow piece extending from the elastic loop portion toward the disc rotor outwardly inclined in the disc radial direction to form a pad springing-back portion (claim 5).
- (vi) The pad springing-back portion contacted with a disc radial direction inner side face of the ear to urge the ear away from the disc rotor and outward in the disc radial direction (claim 5).
- (vii) The pad springing-back portion warped as a shape of a curvature as it extends from the proximal portion (claim 6).
- (viii) The elastic loop portion located on an opposite side of the ear to the disc rotor (claims 7 and 8).
- (ix) The pad retainer includes pad falling-off preventive portions projected on opposite sides of the ears to the disc rotor (claim 9).
- (x) The elastic loop portion is a pad falling-off preventive portion (claim 10).

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Instead, JP 56-129624 shows a spring element 25 with an arc section 27, in addition to two leg portions 26, 28.

Accordingly, Applicants respectfully request that the rejections over claims 1-10 be withdrawn.

***Other Matters***

Claims 11-20 are added for the Examiner's consideration. The newly added claims are directed to the elected embodiment, with at least claims 12 and 18 being generic claims. For many of the reasons noted above, these claims are also distinguishable over the prior art of record and should thus be allowed.



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### CONCLUSION

In view of the foregoing amendments and remarks, Applicants submit that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed.

Respectfully submitted,

A handwritten signature in black ink, consisting of several overlapping loops and a long horizontal stroke at the bottom.

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